Quantitative Depth Profile of *Prochlorococcus* in the Pacific Ocean

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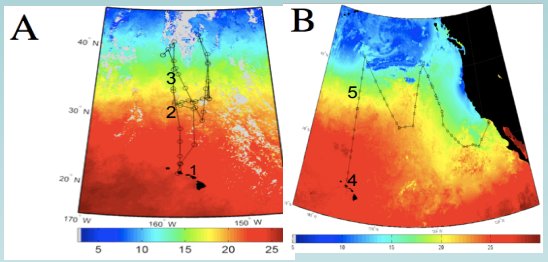
Abstract and Introduction

Prochlorococcus is a genus of extremely abundant marine cyanobacterium. This microbe is responsible for the majority of the primary production within marine environments and is thought to be the single most abundant photosynthetic organism. Thus due to its general abundance and overall importance in oceanic ecosystems, an experiment was prompted to derive the spatial and numerical separation of the members of this genus across the Pacific Ocean through the use of quantitative polymerase chain reaction, or QPCR. These numerical figures were used to determine factors acting upon niche selection and growth parameters specific to each of the genetically different subgroups, termed ecotypes, of *Prochlorococcus*. The ecotypes to be quantified within this experiment are abbreviated as eMIT9313, eMIT9312, eMED4, and eNATL2A. The data shows that each of these ecotypes have differing abundances in areas of the ocean as well as various depths due to temperature, light intensity, and seasonal climate/weather changes.

Methods and Materials

Samples were taken from various stations across the Pacific Ocean using a CTD. These water samples were filtered using 0.2 micron filters, flash frozen using liquid nitrogen, and sent back to the university for processing. Filters were reconstituted and microbes present were quantified through the use of ecotype-specific quantitative polymerase chain reactions.



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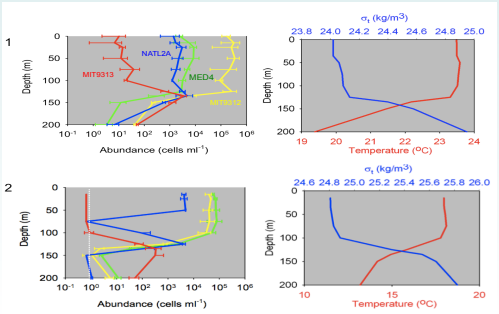
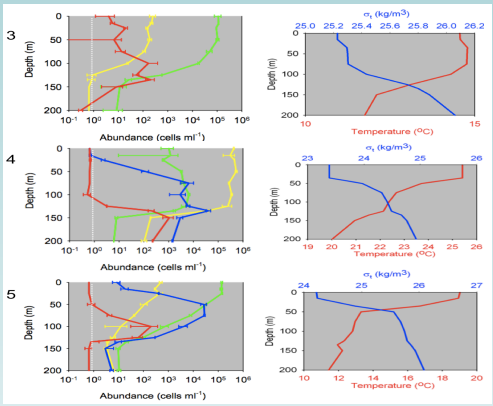
A.) POWOW 2 – January 2013
B.) POWOW 3 – July 2013

Results and Conclusion

From the data gathered throughout our experiments, it is evident that the relative abundances of *Prochlorococcus* are mainly dependent upon the water temperature and depth. Each ecotype is shown to occupy a certain niche of temperature and depth that varies only slightly from season to season, as shown by the following data representations..



Results / Conclusion Cont.



Acknowledgements

We would like to thank the Captain and crew of the R/V Kilo Moana. We thank the University of Tennessee department of Microbiology, and the NSF (OCE-0526072 and OCE-1030518) for supporting our research.

References

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